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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,151	06/27/2003	Christopher F. Robinson	FIS920030069	1150

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EXAMINER	
STOCK JR, GORDON J	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/604,151	ROBINSON, CHRISTOPHER F.	
	Examiner	Art Unit	
	Gordon J. Stock	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 9-20* is/are rejected.

7)☒ Claim(s) *7 and 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 4, 9-14, 19, and 20** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. **Claims 4 and 19** are indefinite due to the term, "each radius of the test pattern." This term is unclear for the test pattern is substantially rectangular due to plurality of horizontal line patterns and vertical patterns and not circular.

4. **Claims 10 and 20** are indefinite due to the term, "at least one feature that varies in size from less than a nominal resolution limit of a lithography tool to greater than the nominal resolution limit" because it is unclear how at least one feature may vary in size. **Claims 11-14** are rejected for being dependent upon a rejected base claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1-3, 5, 6, and 15** are rejected under 35 U.S.C. 102(e) as being anticipated by **Schulz (6,765,282).**

As for **claims 1 and 15,** Schulz in a method for determining critical dimensions discloses the following: a test pattern comprising: feature patterns (Fig. 2: 213, 214); horizontal line patterns (Fig. 2: 204); vertical line patterns (Fig. 2: 204); the features patterns are interleaved with the horizontal line patterns and vertical line patterns (Fig. 2: 213, 214, 204); and are a plurality due to a plurality of elementary cells (Fig. 1a: 100; 106); wherein the test pattern image is exposed on a resist coated substrate (col. 1, lines 20-30; col. 7, lines 45-65); analyzing the test pattern image to evaluate the lithography tool resolution, by evaluating critical dimension (col. 3, lines 4-30; col. 2, lines 5-10).

As for **claims 2, 3, 5, 6,** Schulz discloses everything as above (see **claim 1**). In addition, he discloses at least four feature patterns located at the center of the test pattern for four elementary cells are located in the center of the test pattern (Fig. 1a: 100, 106; Fig. 2: 213, 214); each corner of the test pattern includes a feature pattern for the test pattern has four corner elementary cells (Fig. 1a: 100, 106; Fig. 2: 213, 214); and each midpoint of each side of the test pattern includes a feature pattern (Fig. 1a: 104); and the test pattern has a plurality of rows and columns comprising a set of at least 16 elementary cells with a horizontal pattern and vertical pattern located in both rows and columns (Fig. 1a; Fig. 2: 204).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. **Claims 10 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Fritze et al. (2003/0165749)** in view of **Temple (4,644,637).**

As for **claims 10 and 13**, Fritze in a method and system of lithography teaches sub-patterns: sets of positive tone holes and sets of negative tone holes, arrays of contacts and pillars (paragraph 0173). He does not explicitly state sets of finger arrays, but he suggests it by having transistor gate features (paragraph 0173). Temple in a semiconductor device teaches that gates are fingers (Fig. 4: 108). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that the surface comprised finger arrays, for it comprises narrow line features, transistor gate features. As for the plurality of feature patterns, he is silent. However, he does state that the patterns are formed by a stepper on a wafer (paragraph 0004). Examiner takes official notice that it is well known in the art to have the wafer comprise a plurality of dies. Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that there are plurality of feature patterns for the patterns are exposed on a plurality of dies to form a plurality of electronic devices, chips, from a single wafer.

As for **claims 11-12**, Fritze in view of Temple discloses everything as above (see claim 10). Fritze silent concerning interleaving feature patterns with horizontal and vertical line patterns. However, Morikawa in an alignment check pattern for multi-level interconnection teaches interleaving horizontal and vertical patterns with feature patterns for provide favorable multi-level interconnection of at least three separate levels (Fig. 3a; col. 5, lines 20-55). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was

made to have feature patterns interleaved with horizontal and vertical patterns in order to provide multi-level interconnection of at least three separate levels of the semiconductor device.

9. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Schulz (6,765,282).**

As for **claim 16**, Schulz discloses everything as above (see **claim 15**). And discloses multiple exposure steps, photolithographic steps (col. 7, lines 50-60). He is silent concerning varying the exposure times but implies varying exposure times by teaching imperfect overlay between layers due to temperature differences between times of exposure. And that the patterns are different with differing materials (Fig. 2a). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the additional exposure step for another pattern layer having a different exposure time due to the different material and process characteristics of the differing patterns and to compensate for temperature variations between exposures.

10. **Claims 17-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Schulz (6,765,282)** in view of **Lin et al. (5,847,818).**

As for **claims 17-18**, Schulz discloses everything as above (see **claim 15**). And discloses measuring critical dimension of the pattern (col. 5, lines 9-20; col. 7, lines 60-67). He is silent concerning using a microscope. However, Lin in a CD measurement apparatus teaches using a scanning electron microscope to measure CD's in the deep submicron field (col. 1, lines 10-20). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to use a SEM microscope in order to measure increasingly smaller features on a wafer such as features in the deep submicron field. And he discloses adjusting the lithography tool

resolution based on the CD measurements improving numerical aperture, depth of focus, and wavelength of light of the lithography tool (col. 1, lines 35-45).

Allowable Subject Matter

11. **Claims 7-8** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 3, 9, 14, 19, 20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

As to **claim 3**, the prior art of record, taken alone or in combination, fails to disclose or render obvious a test pattern a midpoint of each radius of the test pattern includes a feature pattern, in combination with the rest of the limitations of **claim 3.**

As to **claim 9**, the prior art of record, taken alone or in combination, fails to disclose or render obvious a test pattern a set of isolated lines; a set of isolated spaces; a set of finger arrays; and a set of contact holes, in combination with the rest of the limitations of **claim 9.**

As to **claim 14**, the prior art of record, taken alone or in combination, fails to disclose or render obvious a test pattern a set of isolated lines; a set of isolated spaces; a set of diagonal crosses; a set of rectangle, in combination with the rest of the limitations of **claim 14.**

As to **claim 19**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method of evaluating a lithography tool resolution the feature patterns are located in a midpoint of each radius of the test pattern image, in combination with the rest of the limitations of **claim 19.**

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and

2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: **(703) 872-9306**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431. The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

As to **claim 20**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method of evaluating a lithography tool resolution wherein each feature pattern includes a plurality of sub-patterns that include: a plurality of sets of positive tone holes; and a plurality of sets of negative tone holes, in combination with the rest of the limitations of **claim 20.**

Conclusion

Several facts have been relied upon from the personal knowledge of the examiner about which the examiner took Official Notice. Applicant must seasonably challenge well known statements and statements based on personal knowledge when they are made by the Board of Patent Appeals and Interferences. In re Selmi, 156 F.2d 96, 70 USPQ 197 (CCPA 1946); In re Fischer, 125 F.2d 725, 52 USPQ 473 (CCPA 1942). See also In re Boon, 439 F.2d 724, 169 USPQ 231 (CCPA 1971) (a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice). If applicant does not seasonably traverse the well-known statement during examination, then the object of the well known statement is taken to be admitted prior art. In re Chevenard, 139 F.2d 71, 60 USPQ 239 (CCPA 1943). A seasonable challenge constitutes a demand for evidence made as soon as practicable during prosecution. Thus, applicant is charged with rebutting the well-known statement in the **next reply** after the Office action in which the well known statement was made.

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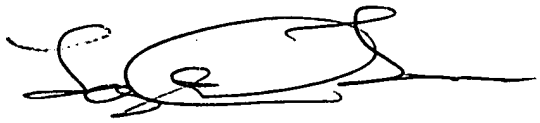

gs
April 16, 2005

Layla Lauchman
Primary Examiner
Art Unit 2877